



## Safety & Mission Assurance

Presenter

**M. D. Erminger**

Date

**February 14, 2002**

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# STS-109

## Flight Readiness Review



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# Approach and General Description

**S&MA held reviews in preparation for the STS-109 Flight Readiness Review on 6 and 11 February 2002 and is ready to proceed toward launch countdown.**

## FRR Briefing Overview

- **Significant assessments - *discuss***
- **Special topics**
  - **NASA Safety Reporting System (NSRS) - *discuss***
  - **Space Shuttle Hazard Analysis - *discuss***
  - **Space Shuttle FMEA/CIL – *discuss***
- *Space Shuttle Independent Assessments - none*
- *Significant Open Work - none*
- *CoFR Exceptions - none*
- *Open Action Items - none*



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# Significant Assessments

## Orbiter/GFE

- Raytheon Transistor Intermetallic Growth *\*Significant Open Work*
- STS-108 Drag Chute Problem

## SSME

- Main Injector LOX Post Tip Indentations

## SRB

- APU Controller Module Diode Test Failure

***ADDITIONAL ASSESSED ITEMS ARE IN THE BACKUP CHARTS***



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# Significant Assessments

## ET

- **ET-118 LO2 Feedline Foam Delamination**

## Launch & Landing

- **STS-108 Handrail Investigation**
- **STS-108 GH2 Vent Arm Anomaly**
- **Hazardous Gas Detection System 2000 Status**

***ADDITIONAL ASSESSED ITEMS ARE IN THE BACKUP CHARTS***



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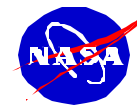
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# Significant Assessments

## Safety Improvements Incorporated on OV-102 During Major Modification

- **APU System Fuel & GN2 Servicing QD Upgrade**
  - Eliminated hydrazine leak path
- **Kapton Wire Inspection**
  - Eliminated possible wire shorts
  - 413 segments repaired
- **OMS/RCS Crossfeed Line Replacement**
  - Eliminated on-orbit thermal constraint
- **Aft Avionics Bay Coldplate Replacements**
  - Eliminated corrosion & coining
- **MPS Helium Check Valve Replacement**
  - Eliminated cocking
- **Radiator Impact Protection & Isolation**
  - Reduced probability of loss of a FCL in the event of a MMOD impact
- **576 Bulkhead Coldplate/Coolant Line Removal**
  - Eliminated a critical failure mode
- **Replace Display Driver Unit with Device Driver Unit (DDU)**
  - Replaced hardware with known failure history
- **20 G Floor Modification (CDR, PLT, and MS3)**
  - Restored structural margin of safety
- **Wing Strut Tube Modifications**
  - Restored structural margin of safety
- **Base/Dome Heat Shield Structural Repair**
  - Eliminated existing damage
- **MEDS Installation**
  - Replaced aging/obsolete electro-mechanical flight instruments



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# NSRS Summary

**There are no NASA Safety Reporting System reports open that are applicable to STS-109.**



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# Hazard Analysis Summary

**There are no new Accepted Risk hazards identified for STS-109.**



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# FMEA/CIL Summary

**There are no new Criticality 1 failure modes identified for STS-109.**





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# **STS-109 Readiness Statement**

**With the satisfactory completion of identified open work, Safety and Mission Assurance has no constraints to STS-109. S&MA has no issues that constrain any of the mission success criteria.**

**/s/ John Casper**

**SR&QA Director, JSC**

**/s/ Amanda Goodson**

**S&MA Director, MSFC**

**/s/ Mark Erminger**

**SS SR&QA Manager**

**/s/ Shannon Bartell**

**Director, KSC Safety, Health  
and Independent Assessment**

**/s/ Bill Higgins**

**Chief, Shuttle S&MA, KSC**

**/s/ Hank Davis**

**HEDS IA Director**

**/s/ Mike Smiles**

**S&MA Manager, SSC**



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# STS-109

## Flight Readiness Review

### Backup Package



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# Additional Assessments

### Orbiter/GFE

- First Flight/Critical Process Change
  - First Flight of OV-102 Following Major Modification
  - First Flight Of The Device Driver Unit
- STS-108 IMU #2 BITE Failure
- STS-108 Flash Evaporator System Controller Anomaly
- STS-108 RCS Thruster Failures - R4U And F3F
- STS-108 Space to Space Orbiter Radio Problems
- Water In The Forward Fuselage
- Hydraulic Main Pump Mounting Flange Washer Issue
- Hydraulic Main Pump Port Cap Bolt Issue
- Payload Pay Door AC1 Phase A Missing



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# Additional Assessments

### RSRM

- New O-ring Resiliency Test Data
- Nozzle Bondline Residual Stress Waiver

### ET

- First Flight/Critical Process Change
  - New Ice/Frost Foam Mold and LH2 PAL Ramp Angle
  - LH2 Burst Disc Repair
  - LO2/LH2 Ullage Pressure Flex-hose Process Change
  - LO2 Tank Dome Cap Reallocation

### SRB

- SRB/ET Attach Ring/Attach Strut Closeout Cover Debond
- SRB TVC Hydraulic Pump Bolt Torque Preload

### SSME

- LPOTP Nozzle Vane Cracks

### KSC SHIA

- Effectiveness of Mission Processing Team and Contractor Control Working Group
- Effectiveness of Launch Processing Team